

# **DOES GOVERNMENT HEALTH SPENDING INCREASE WHEN WOMEN DECIDE?**

Geir Sølve Sande Lie



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Department of Health Management and Health Economics

Faculty of Medicine

University of Oslo

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# PREFACE

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Geir Sølve Sande Lie

## Abstract

This paper examines the issue of female political representation and the extent to which it affects government health spending as a share of GDP in states with varying income levels. First, the paper reviews and discusses the broad literature on determinants of government health spending and the literature related to gender and health spending, generally. Second, it tests whether female parliamentary representation can explain parts of the variation in government health spending across countries and over time. To do so, it uses country-level data and controls for known determinants of government health spending. The results show that increased female parliamentary representation is associated with higher government health spending. Moreover, this association remains significant even after controlling for other determinants of government health spending, indicating that the effect may be partially causal. The results also indicate that if low- and middle-income countries increased their share of women in parliaments by 10 percentage points, government health spending as a portion of GDP would, on average, increase by between 10 and 12 percent. The corresponding figure for high-income countries is around 5 percent. Overall, the analysis suggests that the level of female representation in parliaments has significant effect on countries health spending.

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# 1. INTRODUCTION AND BACKGROUND

There is a wide variation in the extent to which government spending on health varies across countries. In 2007, countries such as Myanmar and Azerbaijan spent less than 3 percent of their respective budgets on health. At the other end of the spectrum, Costa Rica and Montenegro spent over 25% percent of their budgets on health. As share of GDP, Myanmar and Pakistan spend less than 0.8% on health while Timor-Leste, Marshall Islands, and Micronesia spend more than 10%<sup>1</sup>.

In line with the literature, there are several explanations for why government health spending differs. While national income is a key determinant, other relevant factors found in the literature include: political economy considerations, the prevalence of corruption, governance, trade openness, and ethnolinguistic fractionalization. These determinants will be reviewed in the next section.

This paper explores whether gender has an effect on government health spending. Are countries where gender equality is more pronounced more likely to invest in health, controlling for other possible factors? To evaluate this notion, this paper will use simple econometric approaches. Government health spending is measured as share of GDP, and consist of public health spending, central and local budgets, external borrowing, grants, and health insurance funds. The share of women in parliament is used as the measure of gender parity.

Reviewing the cross sectional literature on what others have found to be relevant determinants of government health spending, those determinants are used as control variables to explore if gender could be a potential explanation on macro level government health spending. But why look at gender?

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<sup>1</sup> Source: World Health Organization, National Health Accounts

One prominent reason why gender could be seen to have an effect on government health spending is seen from Figure 1. Data from 2006-2008 show on average, countries that are progressive in women standing in political and economic forums, seem to possess a strong relationship to governments that spend more on health as a portion of GDP.<sup>2</sup> A second reason is that studies done on intra-household level show gender affects allocations. When a female decides, child health and health become prioritized.<sup>3</sup> Even at a sub national level studies suggest women provide more public goods (such as provision of water sources), than their male counterparts.<sup>4</sup> This suggests that gender has an effect on health spending at the micro level. Few or no studies have been done at the macro level. A third reason to explore this relationship is to see consequently whether micro-level results are valid on the macro level. Using cross-sectional data this paper aims to answer: Is gender a relevant factor in cross-country and within country empirical analysis of government spending on health?

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<sup>2</sup> Definition: Gender Empowerment Measure (GEM), is a measure of agency. It evaluates progress in advancing women's standing in political and economic forums. It examines the extent to which women and men are able to actively participate in economic and political life and take part in decision-making. While the GDI focuses on expansion of capabilities, the GEM is concerned with the use of those capabilities to take advantage of the opportunities of life.

<sup>3</sup> Section 3.1 brings forward the supported literature

<sup>4</sup> Section 3.2 brings forward the supported literature

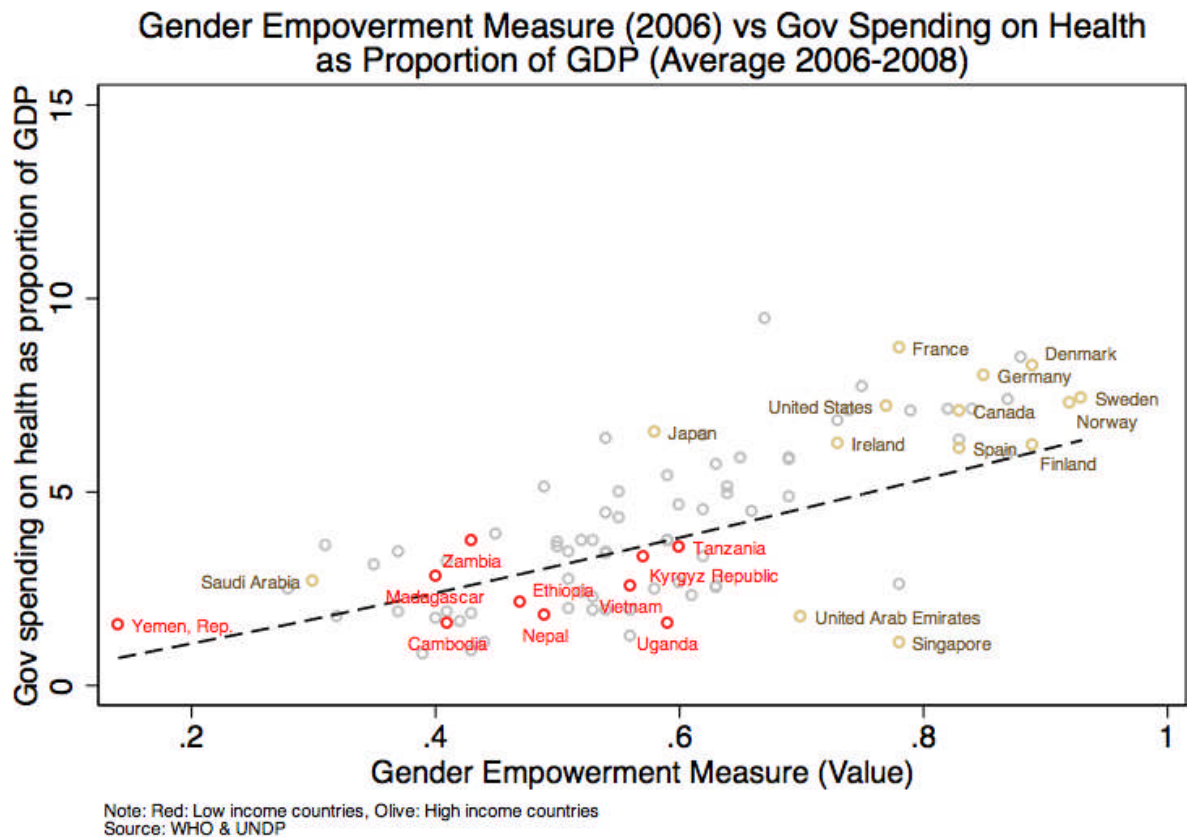


Figure 1. Gender Empowerment Measure (2006) vs. Government Spending on Health as Proportion of GDP (average 2006-2008)

The remainder of the document is organized into seven sections. Section 2 reviews the literature for the relevant factors determining government health spending across countries. Section 3 reviews the literature on the role of gender related factors determining allocations to health at a household and sub-national level. The fourth section analysis the empirical data regarding the effect of gender on government health spending. Section five presents the results from the cross and within country analysis on gender and the relationship to government health spending. The final section concludes and discusses policy implications.



## 2. DETERMINANTS OF GOVERNMENT HEALTH SPENDING: REVIEW OF THE CROSS-SECTIONAL LITERATURE<sup>5</sup>

National income: National income is a key determinant of government spending on health across countries. Wealthier countries tend to spend more on health.<sup>6</sup> Figure 2 shows the average government health expenditure share of GDP for countries at different income levels in 2007. Low-income countries spent slightly over 2% of GDP on health, high-income countries devoted more than 5% of their GDP to the sector.

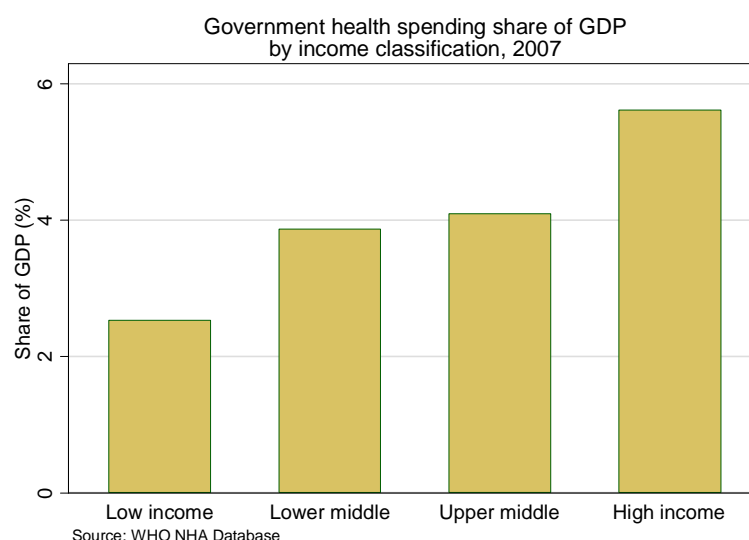


Figure 2. Government Health Spending Share of GDP by Income Classification, 2007

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<sup>5</sup> This paper focuses mainly on the literature on determinants on government health spending for low and middle-income countries. For a review of the empirical evidence on the determinants in high income countries read Gerdtham, U.G. And Jonsson, B. (2000), "International comparisons of health expenditures: Theory, Data, and Econometric analysis", in A.J. Culyer and J.P. Newhouse (Eds.), Handbook of health economics, Vol. 1A, Elsevier, Amsterdam; Sanz I, Velázquez, F. J (2002) "Determinants of the Composition of Government Expenditure by Functions" Working Paper no. 13/2002, The European Economy Group; And most recent: Shelton, C. A. (2007). "The size and composition of government expenditure." Journal of Public Economics 91(11-12): 2230-2260.

<sup>6</sup> ADB (2006), *Key Indicators: Measuring Policy Effectiveness in Health and Education*, Manila: Asian Development Bank.

Among low-income countries there is a wide variation in government health spending. Figure 3 shows health's portion of the budget in low-income countries in 2007 that ranging from 1.1% in Pakistan to over 27.7% in Rwanda.<sup>7</sup> Lower revenue-generating capabilities of governments in low-income countries could be reason government health expenditure, as a share of the overall budget, tends to be low. This fact does not explain why the share of government spending on health is lower in low-income countries. From a cross-section perspective, the rising share of health in the government budget is crude evidence of a health-specific version of Wagner's Law. Wagner – a 19<sup>th</sup> century German political economist – argued that there was a tendency for the size of the government, as a share of the economy, to grow as economic growth takes place. Wagner postulated several explanations for this theory.<sup>8</sup>

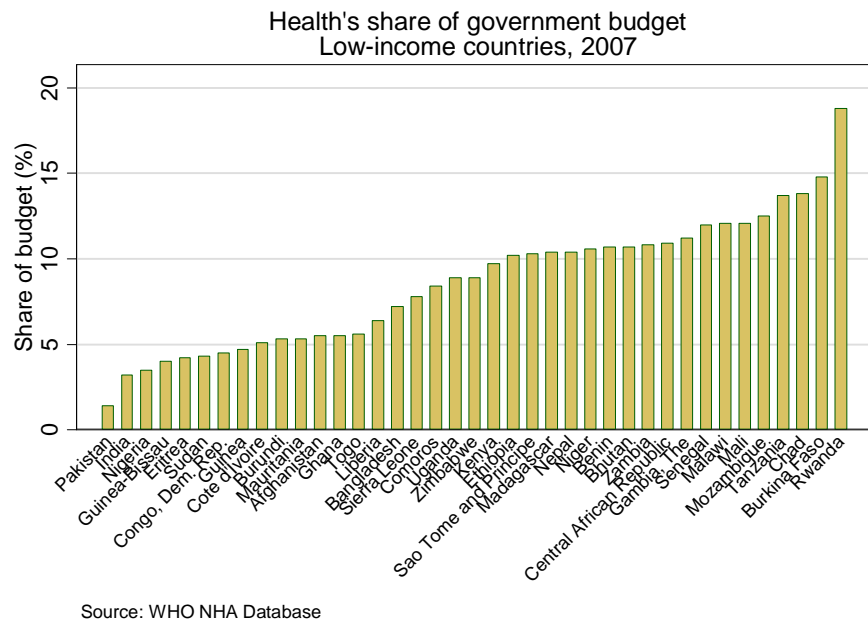


Figure 3. Share of Health in Government Budget in Low-Income Countries, 2007

There are several reasons that could explain why government's health spending tends to increase with income. One simple explanation, as pointed out by Herrera and Pang (2004) is change in relative prices as GDP expands.<sup>9 10</sup> Health provision is a relatively labor-

<sup>7</sup> These numbers are WHO estimates and may not correspond exactly to numbers from country estimates.

<sup>8</sup> Peacock, A. and A Scott (2000), "The Curious Attraction of Wagner's Law," *Public Choice*, 102: 1-17.

<sup>9</sup> Herrera, S. and G. Pang (2004), "Efficiency of Public Spending in Developing Countries: An Efficiency Frontier Approach," Policy Research Working Paper No. 3645, Washington, DC: World Bank.

intensive activity and, because wages relative to other prices increase with growth, the same level of health service provision becomes more expensive to provide in richer countries. This change in relative prices could result in a rise of health's share of the government budget even if the aggregate amount of health output produced by the government remains unchanged.

A second explanation is that the revenue-collecting capacities of governments increase with income, creating fiscal space for increasing government expenditures. A third explanation for the rise in health's share of the government budget is a possible change in societal preferences. Citizens are more likely to demand and expect more and better health and social services from the government as their income rises. Wealthier countries tend to have larger elderly populations with more non-communicable diseases and a greater need for chronic care. This situation increases demand for services, and therefore increases health spending.<sup>11</sup> In addition to income, allocations towards health are not only determined by the total amount of resources available in the economy, but by domestic, international politics, public allocation decision, and several other relevant determinants of government health spending.

Level of democracy: Do governments in democratic countries spend proportionally more on health? The median voter hypothesis predicts that in low-income democratic countries, (where the median voter is likely to be poor) governments should place a greater emphasis on spending for sectors such as health.<sup>12</sup> This hypothesis has been confirmed, but also rejected by the literature. Baqir (2002) finds significant impact on democracy on social spending<sup>13</sup>. Keefer, P. and S. Khemani (2005) find it does not hold for low-income-

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<sup>10</sup> There is speculation as to the reasons why, in general, "government activity" rises with income. Possible explanations include the fact that demand for government provision of services such as transport and communications rises with industrialization, as does the need for social welfare due to growing urbanization and population conglomeration.

<sup>11</sup> ADB (2006), *Key Indicators: Measuring Policy Effectiveness in Health and Education*, Manila: Asian Development Bank.

<sup>12</sup> Meltzer, A. and S. Richard. 1981. "A Rational Theory of the Size of Government," *Journal of Political Economy*, 89(5): 914–927.

<sup>13</sup> Baqir, R. 2002. "Social Sector Spending in a Panel of Countries." IMF Working Paper No. WP/02/35. Washington, DC: International Monetary Fund.

countries.<sup>14</sup> On average, it appears that more democratic countries do spend more on health.<sup>15</sup> A point of interest is for health outcomes, many countries that have performed well in terms of health outcomes are not democracies (e.g., Cuba, China, and Vietnam). And many democracies (such as India) have performed extremely poorly on health.

Trade openness: Shelton (2007) has an eminent review of the different hypothesis in the literature on this topic. The prominent one is Rodrik's hypothesis (1998), which state countries with open economies tend to have larger governments. Open economies can increase countries exposure to risk, leading to rising social and welfare spending (not health spending specifically). Shelton's results explain how developed and developing countries can be viewed differently in terms of how the total expenditure associated with larger trade openness is looked upon. While in developed countries the increase is concentrated in social security. In developing countries, greater openness is associated with spending on transportation infrastructure and education. However, Shelton concludes it is a topic where more research is needed for a reliable conclusion.

Ethnic fractionalization:<sup>16</sup> Ethnic fractionalization is another determinant to understand government resources allocated to health. Using cross-country data, Kuijs (2000) found evidence that ethnic fractionalization has a negative effect on spending as well as the efficiency of government health spending.<sup>17</sup> McCarty (1993) found no evidence that demographic diversity would impact public expenditure. Rather than decrease spending, McCarty suggested it would encourage decentralization.<sup>18</sup> Shelton (2007) uncovered evidence that preference heterogeneity leads to decentralization rather than outright decreases in government expenditures (also a new explanation for Wagner's Law). Lower spending by the central government is significantly offset by higher spending from the

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<sup>14</sup> Keefer, P. and S. Khemani. 2005. "Democracy, Public Expenditures, and the Poor: Understanding Political Incentives for Providing Public Services." *World Bank Research Observer*, 20(1): 1–27.

<sup>15</sup> Ross, M (2006), "Is Democracy Good for the Poor?" *American Journal of Political Science* 50(4):860–74.

<sup>16</sup> Ethnic fractionalization is measured as the likely hood that any two randomly drawn individuals from a population will be from different ethnic groups.

<sup>17</sup> Kuijs, L. 2000. "The Impact of Ethnic Heterogeneity on the Quantity and Quality of Public Spending." IMF Working Paper No. WP/00/49. Washington, DC: International Monetary Fund

<sup>18</sup> McCarty, T.A. 1993. "Demographic Diversity and the Size of the Public Sector." *Kyklos*, 46(2): 225–240.

local governments.<sup>19</sup> The correlation between ethnic diversity and spending might not be an exact according to Jackson (2009), who argues that the problem lies with the quality of spending, and not the quantity. *“Thus if the public good is associated with high spillovers between groups then a negative effect of ethnic diversity will be caused by a reduction in the quantity of spending with no expected effect on the quality of spending. Conversely, low spillovers between groups would indicate the problem lies with the quality of spending”*.<sup>20</sup> Liebermann (2007)<sup>21</sup> supports the claim that government health spending decreases as ethnic fractionalization increases. He analyzes the effects of ethnic fractionalization on government AIDS policies and found that increased ethnic fractionalization affects AIDS policies, even after controlling for income per capita. The method he used to test this theory is interesting and unorthodox. Instead of using actual HIV/AIDS spending data, he reviewed country’s budget speeches and the amount HIV and AIDS commitments that were mentioned. This is not an optimal indicator for the reason it will only be a “soft commitment” compared to actual spending data. Mentioning HIV/AIDS in a speech does not transfer into actual spending, but Liebermann argues strongly that the budget speech data provides confirmation on actual expenditure. He assumes policy making is driven by the perceived (un)popularity of different policies, expecting that aggressive governments will act more boldly than passive ones who will say little regarding HIV/AIDS spending. Using data from e.g. National Health Accounts on HIV spending compared to budget speech data, Liebermann would have a stronger case.

**Corruption:** The amount of corruption has been suggested as a determinant of government health spending in low and middle-income countries. The literature provides empirical evidence that corruption plays a part in lowering social expenditure in terms of government health and education spending. These studies control for relevant indicators

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<sup>19</sup> Shelton, C. A. (2007). "The size and composition of government expenditure." *Journal of Public Economics* 91(11-12): 2230-2260.

<sup>20</sup> Jackson, K (2009), “Culture and Government An Analysis of the Interaction Between Formal and Informal Institutions”, a thesis submitted in partial fulfillment of the requirements for the degree of doctor of philosophy in The Faculty of Graduate Studies (Economics). The University of British Colombia (Vancouver) link: <http://www.kjackson.net/research/files/kentthesis.pdf>

<sup>21</sup> Lieberman, E. S (2007), “Ethnic politics, risk, and policy-making - A cross-national statistical analysis of government responses to HIV/AIDS”. *Comparative Political Studies* 40(12);1407-1432.

such as income, and size of government.<sup>22 23 24 25</sup> One reason why corruption effects the reduction of government health spending could be that health projects require large sums of money. Corrupt governments may be seeing the possibilities for larger kickbacks.<sup>26</sup> If health projects were to potentially bring larger kickbacks for corrupt governments, it's been found the result is a decrease and not increases in spending. We can question the accuracy of this particular type of data because it involves countries reporting their own shortcomings.

Additional factors found in the literature include: i) historical, relating in part to colonial experiences and institutional inheritances; ii) Institutional factors, affecting social security spending (Hicks and Swank, 1992 and Alesina, 1999). As in India where regional health expenditure is determined not only by iii) real state per capita income, but also by iv) literacy rate<sup>27</sup>; v) engagement by civil society organizations; vi) the level of decentralization<sup>28</sup>.

This section reviewed the cross-country literature with respect to determinants for government health spending. The next section reviews the literature on gender and health spending.

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<sup>22</sup> Mauro, P. 1997. "The Effects of Corruption on Growth, Investment and Government Expenditure: A Cross-Country Analysis." In *Corruption and the World Economy*, edited by K.A. Elliot. Washington, DC: Institute for International Economics

<sup>23</sup> Mauro, P. (1998). "Corruption and the composition of government expenditure." *Journal of Public Economics* 69(2): 263-279.

<sup>24</sup> Delavallade, C. (2006). "Corruption and distribution of public spending in developing countries." *Journal of Economics and Finance* 30(2): 222-239.

<sup>25</sup> Ghobarah, H, Huth, P and Russett, B (2004), "Comparative Public Health: The Political Economy of Human Misery and Well-Being" *International Studies Quarterly* (2004) 48, 73–94.

<sup>26</sup> ADB (2006), *Key Indicators: Measuring Policy Effectiveness in Health and Education*, Manila: Asian Development Bank.

<sup>27</sup> Rahman, T (2008), "Determinants of public health expenditure: some evidence from Indian states", *Applied Economics Letters* 15(11);853-857.

<sup>28</sup> Mosca, I (2007) "Decentralization as a determinant of health care expenditure: empirical analysis for OECD countries," *Applied Economics Letters*, 14(7-9);511-515

### 3 GENDER'S RELATIONSHIP TO ALLOCATIONS FOR HEALTH: A REVIEW OF THE LITERATURE

Do women make a difference in prioritization of health, or do women make the same choices as men? Becker (1991) found that both men and women make decisions with a priority on maximizing household income. However to suppose such a harmonious relationship within a household, a village council or in parliament; assuming that women and men have the same preferences is by far a rough assumption. To exemplify this we can look at the relationship between women's suffrage and social spending in Western Europe. Time series data tells us that social spending increased by 0.6 – 1.2 percent in the short term, and three to eight times higher long term, is consequential of women's suffrage.<sup>29</sup> Abraham (1999)<sup>30</sup> comes to similar results.

There is little to no research regarding gender as a determinant for macro level government health spending. Hence the next sections review the literature from household and sub-national/individual country level. When women make decisions, is spending on health prioritized more so than if men were to decide?

#### 3.1 Women as Decision Makers Within the Household

There is evidence that indicates households cannot be treated as a single entity decision maker. This is due to relative income from each family effecting spending priority. Duflo (2005)<sup>31</sup> has tested whether income in the hands of women has a different impact on intra-household allocation compared to men. Referring to studies where the evidence suggest assets in the hands of women is associated with larger improvements in child health (Thomas, 1990), larger expenditure shares of household nutrients, health, and housing

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<sup>29</sup> Aidt, T. S. and B. Dallal (2008). "Female voting power: the contribution of women's suffrage to the growth of social spending in Western Europe (1869-1960)." *Public Choice* 134(3-4): 391-417.

<sup>30</sup> Abrams, B. A. and R. F. Settle (1999). "Women's suffrage and the growth of the welfare state." *Public Choice* 100(3-4): 289-300.

<sup>31</sup> Duflo, E (2005), "Gender Equality in Development", Bureau for Research in Economic Analysis of Development, Policy Paper No. 011 Link: <http://ipl.econ.duke.edu/bread/papers/policy/p011.pdf>

(Thomas 1992), and children are in better health if their mother brought more resources into the marriage (Thomas, Frankenberg, and Contreras (2002)).<sup>32</sup> A recent paper by Bobonis (2009) using data from the Mexican PROGRESA program on women's income program supports the theory with data. Female-specific income changes have a substantial effect on children's goods expenditure shares.<sup>33</sup>

Duflo and Udry (2004) explored gender differences in household spending in a study based in Côte d'Ivoire. It was found that men and women grow different crops; therefore the same rainfall has a different effect based on who makes agricultural decisions. The effects of this change consumption within the family in years when the production of women's crops is higher, the household spends a bigger share of its budget on food and private goods for women. In years when the production of male's crops is higher, the household spends a bigger share of the budget on alcohol and tobacco and male private goods. Duflo suggest the identity of the income recipient has an impact on its allocation. Duflo (2003)<sup>34</sup> strengthened these views by exploring the effects of children's health with their respective grandparents and who are recipients of the Old Age Pension Program. Duflo found that girls who live with a grandmother who receives a pension have a higher body weight than those who live with a grandmother who is not quite old enough to receive the pension. In contrast, no such effect was found when a grandfather receives the pension, and no corresponding effects were found for boys.

Himanshu (2006)<sup>35</sup> elucidated gender inequalities in household's health expenditure in urban Orissa, finding that out of pocket (OOP) expenditure differs significantly between males and females, with males spending more than females. The author points out that while the female OOP is higher in urban compared to rural and tribal Orissa, in all of the

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<sup>32</sup> Thomas, Duncan, Frankenburg, Elizabeth, and Dante Contreras (2002), "Distribution of Power within the Household and Child Health," Mimeo, UCLA

<sup>33</sup> Bobonis, J. G. (2009). "Is the Allocation of Resources within the Household Efficient? New Evidence from a Randomized Experiment." *Journal of Political Economy* 117(3): 453-503.

<sup>34</sup> Duflo, Esther (2003), "Grandmothers and Granddaughters: Old Age Pension and Intra-Household Allocation in South Africa," *World Bank Economic Review* 17(1), 2003, pp. 1-25.

<sup>35</sup> Himanshu Sekhar, Rout (2006): "Gender inequality in household health expenditure: the case of urban Orissa" Published in: *Nagarlok* 3 XXXVIII (2006): pp. 44-48.

Link: [http://mpira.ub.uni-muenchen.de/6544/1/MPRA\\_paper\\_6544.pdf](http://mpira.ub.uni-muenchen.de/6544/1/MPRA_paper_6544.pdf)



areas the male has a stronger influence on OOP. This suggests that people living in urban Orissa have higher income, more education, and show consciousness towards gender. They have an intrinsic value of good health, and therefore might have the willingness and ability to pay for more and higher quality health care.

Female preferences do not necessary favor a healthier lifestyle and healthcare. Edmonds (2006)<sup>36</sup> uses Duflo's (2003) Old Age Pension Reform to study the impact of pension programs on education. The findings suggest that children are more likely to be in school when they live with an eligible man than with an eligible woman. It is uncertain if this is because of women's willingness, or ability to have, and transport children to school. Prioritizing education is not enough for the female population in this case, and men become the more beneficial gender for children's education.

When women are empowered, research has shown that child health as well as public health improves. Power is important on a household level. How would this effect a larger scale, like a village council? The next section examines the literature "one step up"; at the sub national level, where women can have an impact on broader policy decision.

### **3.2 Women as Decision Makers Within The Village Councils/Sub-National Level**

To measure and understand the effects of women as policy makers on health related issues can be difficult for several reasons. Duflo (2005)<sup>37</sup> has focused on this idea. The result found at household level was that females are more concerned about child health, with a priority set on improving a child's health. Another reason builds on this idea, that women will prioritize policies that affect their own set of priorities (health). A potential stringent assumption since in order to be re-elected, politicians need to some extent do what their constituents expect.

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<sup>36</sup> Edmonds, Eric (2006), "Child labor and schooling responses to anticipated income in South Africa", *Journal of Development Economics* Volume 81, Issue 2, December 2006, Pages 386-414

<sup>37</sup> Duflo, E (2005), "Gender Equality in Development", Bureau for Research in Economic Analysis of Development, Policy Paper No. 011 Link: <http://ipl.econ.duke.edu/bread/papers/policy/p011.pdf>

Trying to understand the effects of women as policy makers, Chattopadhyay and Duflo (2004)<sup>38</sup> studied the states of West Bengal and Rajasthan, India after 1992, where one of the requirements was that a third of all council seats and council presidencies were reserved for women. Both researchers theorized that gender play a role in political priority. As an example, they hypothesized that women prefer social investments to those related to transport infrastructure. .

Building on Chattopadhyay and Duflo's findings, Duflo (2005)<sup>39</sup> began to focus on quantity and quality of public goods in India. She found that when the Panchayat<sup>40</sup> (Village level administration of public goods in India) is reserved for women, there are significantly more public water sources available, and those water sources are better maintained. In this situation, she found that the population became less satisfied if their leader was a woman than a man. Duflo argued that this could be a cultural barrier, recognizing women as competent policymakers, and hence possibly explaining why there are so few-elected woman at the local level in India. The same study also found that women take significantly fewer bribes than their male counterpart. Vijayalakshmi (2008)<sup>41</sup> found contradicting evidence to Chattopadhaya and Duflo. In a study focused on India, he found no correlation between gender and corruption in government.

Beaman et al. (2008) explored a random variation in mandated exposure of female leaders across village councils in the Indian state of West Bengal, and found that if the chief councilor of the Panchayat was female, they provided more public goods of equal quality at a lower price, they implemented more pro-women policies, and took less bribes than

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<sup>38</sup> Chattopadhyay, R and E Duflo (2004), "Women as Policy Makers: Evidence from a Randomized Policy Experiment in India," *Econometrica*, 72(5): 1409-1443.

<sup>39</sup> Duflo, E (2005), "Why Political Reservations"? *Journal of the European Economic Association* 3(2-3):668-678 Link; [http://povertyactionlab.org/papers/67\\_Duflo\\_Why\\_Political\\_Reservations.pdf](http://povertyactionlab.org/papers/67_Duflo_Why_Political_Reservations.pdf)

<sup>40</sup> The Panchayat is a system of village-level (Gram Panchayat), block-level (Panchayat Samiti), and district-level (Zilla Parishad) councils, whose members are elected by the people that are responsible for the administration of local public goods. Each Gram Panchayat (GP) encompasses between 1,000 and 10,000 individuals in a group of villages (between 1 and 15). The GPs do not have jurisdiction over urban areas, which are administered by separate municipalities.

<sup>41</sup> Vijayalakshmi, V. (2008). "Rent-Seeking and Gender in Local Governance." *Journal of Development Studies* 44(9): 1262-1288.

their male counterparts.<sup>42</sup> Four year earlier, Duflo and Topalova (2004) found the same results for the Indian State of Bangalore.<sup>43</sup>

High-income countries, such as Sweden, have also been studied in regards to gender and policy actions. A study by women in local councils of Sweden found that increased representation of women in the local council increased spending on childcare and education proportionately to elderly care (Svaleryd, 2009).<sup>44</sup> Halse (2009) finds similar support from Norwegian, that local councils with a higher degree of women spend more on public childcare.<sup>45</sup>

Two relatively new studies challenged and built on the preceding results found in the literature. Bardhan et al (2009)<sup>46</sup> who examined the impact of political reservations for women and scheduled castes and tribes (SC/ST)<sup>47</sup> candidates in local government in West Bengal, India (some of the same geographical area Chattopadhyay and Duflo (2004) studied impacts). He covered a wider geographical area and time period; 1998 – 2004. He also used extensive self-reported household data. Self reported household data is able to measure the distribution of benefits provided by the local government. The evidence showed no positive impact of women reservation in Gram Panchayat on any targeted measure. This was a significant negative effect on some dimensions of targeting public goods to the SC/ST groups.

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<sup>42</sup> Lori Beaman, Raghavendra Chattopadhyay, Esther Duflo, Rohini Pande and Petia Topalova (2008) "Powerful Women: Does Exposure Reduce Bias?" NBER Working Paper No. 14198 Issued in July 2008 <http://econ-www.mit.edu/files/3122>

<sup>43</sup> Esther Duflo and Petia Topalova (2004), "Unappreciated Service: Performance, Perceptions, and Women Leaders in India" Link: <http://econ-www.mit.edu/files/793>

<sup>44</sup> Svaleryd, H. (2009). "Women's representation and public spending." *European Journal of Political Economy* 25(2): 186-198.

<sup>45</sup> Halse, A (2009), "A woman's touch. The impact of gender on political priorities" master thesis, Centre of Equality, Social Organization, and Performance (ESOP), University of Oslo. Link: <http://www.esop.uio.no/research/masterthesis/Halse.xml>

<sup>46</sup> Pranab Bardhan, Dilip Mookherjee, and Monica L. Parra Torrado (December 26, 2009), "Impact of political reservations in West Bengal local governments on anti poverty targeting"

<sup>47</sup> SC/ST are Indian population groupings that are explicitly recognized by the Constitution of India, previously called the "depressed classes".

Taking a second look at household data, Dongrey (2010)<sup>48</sup> researched whether gender had any implication for child health by examining the relationship between prevalence of water borne diseases and gender. He looked at the head of the 593 district village council in India. If the female was head of council, it did not affect the prevalence of water born diseases. However, looking at sub-categories, he found that females from upper castes managed to reduce the prevalence of water born diseases. Villages with female council heads from the CT/ST showed no effect. He also found that upper caste females tend to obtain drinking water from a safe source. This could simply be because upper caste females could have easier access to water compared to lower caste females.

Who makes the best decisions for a community at the sub-national level, women or men? Lindgren et al. (2009)<sup>49</sup> studied the political representation in 24 Indian Villages. The findings support that equal representation of women increases the opinion congruence between elites and masses.

Given that most of the studies found in the literature focus on India, extrapolating evidence from one society to another requires extreme caution. However it leads us to believe that the role of women with respect to investing in health could be a relevant factor at the micro level. Could this imply that gender parity is a relevant factor at the macro level as well? The next section will explore this literature.

### **3.3 Women as Decision Makers at The Macro Level**

In a cross section study of countries, Dollar et al. (2001) found that higher rates of female participation in governments was associated with lower levels of corruption; partly implying that women are less willing to sacrifice the common good for personal gain than

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<sup>48</sup> Ambrish Dongrey (This Version: January 8, 2010), "Female Political Leadership and the Prevalence of Water Borne Diseases: Evidence from a Natural Experiment in India"

<sup>49</sup> Lindgren, K. O., M. Inkinen, et al. (2009). "Who Knows Best What the People Want: Women or Men? A Study of Political Representation in India." Comparative Political Studies 42(1): 31-55.

their male counterparts.<sup>50</sup> While the result of this study doesn't relate to government health spending directly, some may consider the two vaguely linked. As previously discussed, the level of corruption in a country plays a role on government health spending. If female participation in government can reduce corruption, it may be government health spending would be positively affected.

A study that explored government prioritization of health at a macro level was Ghobarah et al. (1999)<sup>51</sup>. The authors approach state leaders, providing six hypotheses asking their reactions to them.<sup>52</sup> The hypothesis where related to the willingness to increase allocations towards government health spending. The study found empirical evidence that supported high level of democracy, education, and per capita income to stand out as economic and social factors the state leaders, in response to terms of increasing government health spending. Dictatorship, severe income inequality, ethnic heterogeneity, and persistent international hostilities decrease government spending on health. A similar finding was supported by Ross (2006) for middle and higher income countries. Given most state leaders are men (for 2007, 193 men worldwide, 23 women); relating the findings as indicators is too vague. At best it would be an indicator male state leaders would respond to. So how can women's impact on government health spending potentially be measured? By exploring women's participation in politics!

Portion of seats held by women in national parliaments differs significantly around the world. In 2007, high-income countries had a higher participation rate compared to low-income countries (Figure 4). While discrimination in social institutions is well known to be one of the causes for this, some countries have now implemented policies to empower

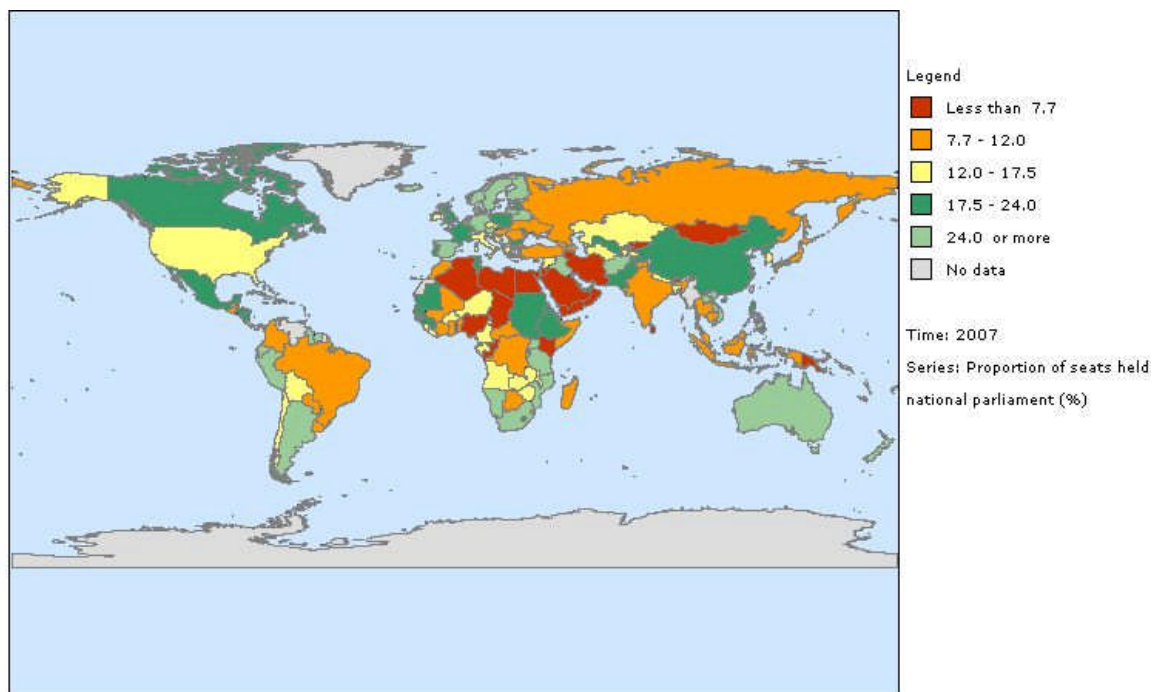
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<sup>50</sup> Dollar, D., Fisman R., Gatti R. (199) "Are Women Really the "Fairer" Sex? Corruption and Women in Government", Policy research report on gender and development, Working Paper Series, No. 4. The World Bank Development Research Group/Poverty Reduction and Economic Management Network  
Link: <http://sec.sec.lt/pages/alfdiskusijos/pages/discuss3/docs/gender%20and%20corruption.pdf>

<sup>51</sup> Ghobarah, H, Huth, P and Russett, B (2004), "Comparative Public Health: The Political Economy of Human Misery and Well-Being" *International Studies Quarterly* (2004) 48, 73–94.

<sup>52</sup> The hypotheses are: (1) high level of democracy; (2) income inequality; (3) racial/linguistic/religious diversity; (4) international rivalry; (5) education; and (6) per capita income.

women. Increasing women in parliament is one of the Millennium Development Goal<sup>53</sup> indicators (MDG 3) – to promote gender equity and empower women.



SOURCE: THE WORLD BANK

Figure 4. Proportion of Seats Held in National Parliament by Women (%), 2007

Can the findings from intra-household and the sub-national level imply that gender parity within government is important for allocations towards health at the macro level? Using macro level data the next section will explore this. Are countries where gender parity within governments, (measured here as the percentage of women in national parliament) be more pronounced, and more likely to invest in health, controlling for other possible determinants?

<sup>53</sup> In 2000, 189 countries committed to attain improvements in human development by 2015, identifying key objectives called Millennium Development Goals (MDGs). To reach these goals, rich and poor nations agreed to work side by side to make significant changes in such areas as health improvements, empowering females, and using resources wisely. The eight goals are: eradicate extreme poverty and hunger; achieve universal primary education; promote gender equality and empower women; reduce child mortality; improve maternal health; combat HIV/AIDS, malaria, and other diseases; ensure environmental sustainability; and develop a global partnership for development.

## **4. EMPIRICAL ANALYSIS: FEMALE REPRESENTATION IN PARLIAMENTS AND GOVERNMENT HEALTH SPENDING**

### **4.1 Cross-Country Approaches**

This section will discuss countries with higher proportion of women in the parliament and its effect on health compared to countries with a low female representation in parliament. Parliamentary institutions are important to the politics of states because parliaments make laws and develop public norms. They also legitimize political systems. They are the representative body for their respective country, and are the space for decision-making.<sup>54</sup> Parliaments approve the health budget, and are a relevant arena to study the significance of female representation.

If the views shown from the previous section from the micro level hold, one would anticipate at the macro level, government health spending would be positively correlated to female representation in parliament. This relationship is shown in Figure 5. Using a three-year average from 2006 to 2008 the graph indicates if anything the higher percentage of women in national parliaments, the higher government health spending as share of GDP is.

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<sup>54</sup> Professor Shirin Rai, Department of Politics & International Studies,  
Link: [http://www2.warwick.ac.uk/newsandevents/warwickbooks/complexity/shirin\\_rai/](http://www2.warwick.ac.uk/newsandevents/warwickbooks/complexity/shirin_rai/)

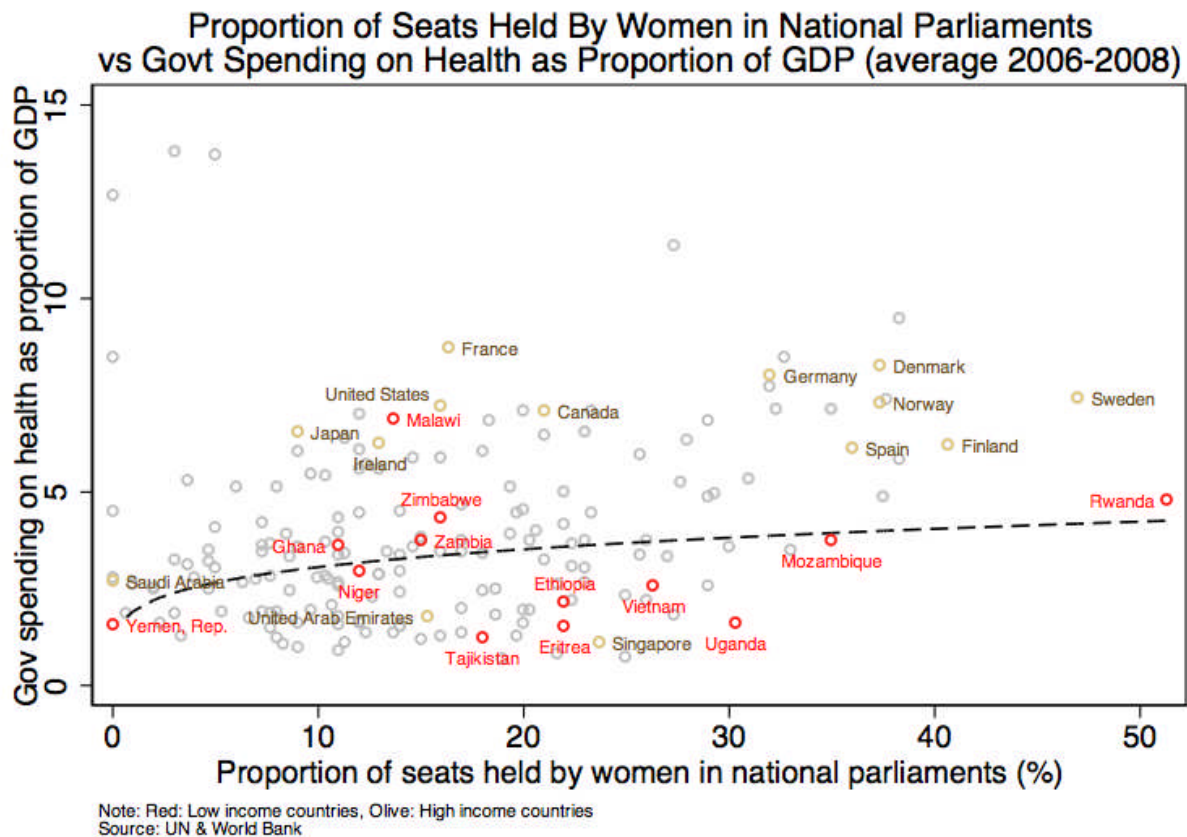


Figure 5. Proportion of Seats Held in National Parliament by Women (%) vs. Government Spending on Health as Proportion of GDP (average 2006 – 2008)

While there seems to be a relationship between the portion of women in parliament and government health spending, this graph may be incorporating other factors like; countries income, level of corruption, democracy, trade openness, and ethnolinguistic fractionalization. By controlling for these determinants with an econometric model the relationship of political representation of women on government health spending can better be singled out.

To investigate this relationship, the next section describes the data that will be used in the two econometric models described in section 4.3. Section 5 will review the results.



## 4.2 Data

Several sources of data were used for this study. This includes data from officially recognized international sources such as the World Bank, World Health Organization, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, and Desmet et al. Data was downloaded and collected from different sources and merged into one dataset<sup>55</sup> using World Bank country codes as the unique identifier. The indicators:

1. World Health Organization (WHO), National Health Accounts offers data on **government spending on health as proportion of GDP (GHEGDP)** which includes public health expenditure consisting of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds. This is the dependent variable.
2. United Nations database provides access to the main indicator **Women in parliaments**. That is defined as the percentage of parliamentary seats in a single or lower chamber held by women. Source: United Nations, Women's Indicators and Statistics database ([www.ipu.org](http://www.ipu.org)). Downloaded, Oct 6, 2010.
3. The World Bank International Comparison Program database provides the **GDP per capita based on purchasing power parity (PPP) (constant 2005 international \$)**. PPP GDP per capita is gross domestic product converted into international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without

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<sup>55</sup> The empirical work and generating of figures, the statistical program STATA 11 version 1 for MAC was used.

making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

4. Transparency International offers the index: **Corruption Perceptions Index**, a score that measures the perceived level of public-sector corruption. The score goes from 1, the most to 10, the least corrupt. The CPI is not intended to measure a country's progress over time but rather be a snapshot of perceptions of corruption, using data published in the past two years. The CPI is a survey of surveys, of experts and businesspeople, based both within a country and abroad.

5. The Center for Systemic Peace (CSP) with their Polity IV Project put forward the indicator for **country's level of democracy**. The polity scale ranges from +10 (strongly democratic) to -10 (strongly autocratic). The revised combined polity score indicator; polity2 is used since it's facilitates time series analyses.

6. Penn World Table<sup>56</sup> provides data on countries **Openness**, and is the total trade as a percentage of GDP (constant price).

7. ELF index: a data set from Desmet et al. (2009)<sup>57</sup> to measure **ethnolinguistic fractionalization**; the probability that two randomly picked individuals belongs to different groups. The variable has only 202 observations, and is collected in this dataset in one year. However each data point refers to a different year for each country, ranging from 1979 – 2001. But given ELF change very little over time, i.e. ELF can be the same and valid for about 50 years or so, the variable is still part as an explanatory variable in this cross-country analysis.

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<sup>56</sup> PWT 6.3 Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.3, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, August 2009

<sup>57</sup> Desmet, K., Ortuno-Ortin, I. and Wacziarg, R. (2009), "The Political Economy of Ethnolinguistic Cleavages," NBER Working Paper #15360, September 2009

Table 1 provides summary statistics of the above variables in the dataset used in Model (1).

**Table 1: Summary Statistics of Variables, Average 2006 – 2008**

<b>Variables</b>	<b>N</b>	<b>mean</b>	<b>sd</b>	<b>min</b>	<b>max</b>
Year	185	2007	0.8	2006	2008
Health expenditure, public (% of GDP), All countries	185	3.9	2.4	0.7	13.8
Health expenditure, public (% of GDP), Low and middle-income	137	3.4	2.3	0.7	13.8
Health expenditure, public (% of GDP), High income countries	48	5.3	2.1	1.1	8.7
Proportion of seats held by women in national parliaments (%), All countries	185	16.3	10.1	0.0	51.3
Proportion of seats held by women in national parliaments (%), Low and middle	137	15	9.3	0.0	51.3
Proportion of seats held by women in national parliaments (%), High income	48	20	11	0	47
GDP per capita, PPP (constant 2005 international \$) in thousands	172	11.5	12.9	.3	71.5
Corruption Perceptions Index: (1, most to 10, least corrupt)	174	4.0	2.1	1.6	9.4
Level of democracy: +10, strongly democratic to -10, strongly autocratic	155	3.8	6.3	-10	10
Openness: Total trade as a percentage of GDP, (constant prices)	179	99.6	51	25.2	450
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups	183	0.16	0.18	0.0	0.6

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 1. Summary statistics of variables in the cross country dataset, Average 2006 – 2008

Missing data is a problem in this type of analysis. Although ethnolinguistic fractionalization has few numbers of observations the data points collide in a complimentary way with other indicators, and therefore did not drop many countries from the analysis. The democracy data did not fit well with the other datasets, and was the variable that dropped the most countries from the analysis.

To investigate further the effects on government health spending with the mentioned indicators in a cross-country, and within country analysis, a simple econometrical analysis was used. The next chapter brings forward the two econometric models.

### 4.3 A Model of The Effects of Female Representation in Parliaments on Government Health Spending

To investigate the relationship between gender and government health spending between countries, the following model is specified:

$$Y_i = \alpha + \beta \text{parliament}_i + \lambda X_i + \varepsilon_i \quad (1)$$

The equation to be estimated is given by (1) where  $Y_i$  represents government health expenditure in country i. Because all countries are observed in the same time period; average, 2006-2008, notation of t is excluded from the model.  $\alpha$  is a constant term, parliament refers to the variable proportion of seats held by women in national parliaments, and is the explanatory variable with coefficient – or marginal effect  $\beta$ .  $X_i$  is a set of control variables and refers to GDP per capita, corruption, level of democracy, trade openness and ethnolinguistic fractionalization.  $\lambda_i$  is their coefficient vector, and  $\varepsilon_i$  is the error term.

Cross-country correlations may be vulnerable to unobserved country differences affecting both health spending and gender representation. As a test for robustness, the analysis is extended with a within country model with fixed country effects. In such a model, the effect of gender representation on health spending is indentified as variation in gender representation *within* the country over time. Such a model will also have its limitations as the within-country variation in female parliamentary representation is limited, and typically changes only when elections are held.

The regressors remain consistent with the exception of ethnolinguistic fractionalization, trade openness, and level of democracy, which have been dropped as they change little

within the selected timeframe. Their eventual importance is thus unidentified when country fixed effects are introduced. The estimated equation is given by (2).

$$Y_{it} = \alpha_i + \beta \text{parliament}_{it} + \lambda X_{it} + \varepsilon_{it} \quad (2)$$

All the variables are described in detail in sections 4.2 and discussed in the literature review in section two. Results from Model (1) are displayed in Table 2 – 4; Model (2), Table 6 – 8.

## 5. RESULTS: RELATING GENDER TO GOVERNMENT HEALTH SPENDING

### 5.1 Cross-Country Analysis

In a cross section analysis where one associates the presence of women in parliament with government health spending, the theoretically best comparison would be if yearly data were present for all variables in all countries. The reason for this is that budgets are decided on an early basis with the female participation in that given year. Controlling for several determinants that might not get tracked each year (and therefore have missing values), we will use an average from 2006 – 2008 for all variables. This will allow us to increase the amount of observations in the analysis. There are downsides to using such an average. If a country were to have a large share of women in parliament two years ago; this would not be relevant if the share is small this year. Such a result might indicate that the variable is picking up other factors than female representation in parliament, e.g. countries level of development. There are several analytic techniques that can be used to fill in missing data in time series. One example is what Institute for Health Metrics and Evaluation (IHME) developed. A technique that can fill in missing data, the program is

called *Déjà vu*.<sup>58</sup> However, it is outside the scope of this paper to use this type of techniques.

Table 2 to 4 present the results from the cross-country regressions using Model (1). In all tables the dependent variable is government spending on health, measured as proportion of GDP (GHEGDP). Table 2 shows results for all countries, Table 3 for low and middle-income countries, and Table 4 for high-income countries (see Annex 1 for detailed information about countries, their income classifications, regions, and the three year average for GHEGDP and women in parliament for each country). Countries are divided by income classification because relationships from high-income countries factor differently than for low and middle-income countries.

Proportion of seats held by women in national parliaments is measured in percentage (from 0 to 100), and therefore the coefficient should be interpreted as the change in the dependent variable (GHEGDP) if the proportion of women in parliaments changes with 1 percentage point.

The tables report results of several simple regression models on variables that in the literature have shown to effect government health spending. What is new is it examines whether the link between Government health spending as share of GDP, and proportion of women in parliaments is robust to inclusion of the other determinants found to effect health spending in the literature. Selection criteria for the rank of indicators put into the model (from Column I to VI) was based on dropping the smallest amount of countries that is feasible for each regression, and has no connection with important of indicators.

Models I to VI differ in terms of the independent variables used. Column I in each of the three tables show the results when proportion of females is the sole independent variable. The coefficient is positive and significant for all, and high-income countries (Table 2 and

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<sup>58</sup> Institute for Health Metrics and Evaluation (IHME) Link:  
<http://www.healthmetricsandevaluation.org/what/areas/tools/models.html#one>

4), indicating that the portion of females in parliament has a positive influence on government health spending.

But does this result just pick up that countries that are richer have higher government health spending, and that women are better represented in these countries – because of countries wealth? Assumed health is a normal good; as a country becomes wealthier, demand for the good (in this case, health) increases. Introducing GDP per capita as an explanatory variable can test for this.

Column II shows the models with both women in national parliaments and GDP per capita. After controlling for GDP per capita, female representation is still positive and significant for all, as well as high-income countries. For low and middle-income countries the coefficient is not significant, it increased from 0.010 to 0.016. GDP per capita is positive and significant for all countries (Table 2) indicating it has a positive influence on government health spending. Another important factor to control for is heterogeneity within countries. Empirical evidence has shown greater heterogeneity to be correlated with lower levels of government investment in health.<sup>59</sup> To measure the effect of heterogeneity, ethnolinguistic fractionalization is used as a proxy for this in the next regression.

Column III reports the regression that includes ethnolinguistic fractionalization (ES); as measured by the probability of two randomly picked individuals belonging to different groups, GDP per capita, and women representation. After controlling for these two variables, female representation remains positive and significant for all, as well as for high-income countries. Ethnolinguistic fractionalization is negative and significant for all, high, and for low and middle-income countries. This confirms the findings of Kuijs (2000).<sup>60</sup> It is interesting that the effect in high-income countries is about three times that of the negative effect compared to low and middle-income countries. Addison and

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<sup>59</sup> Ross, M (2006), “Is Democracy Good for the Poor?” *American Journal of Political Science* 50(4):860–74.

<sup>60</sup> Kuijs, L. 2000. “The Impact of Ethnic Heterogeneity on the Quantity and Quality of Public Spending.” IMF Working Paper No. WP/00/49. Washington, DC: International Monetary Fund

Rahman (2001) found ethnolinguistic fractionalization to be an important factor for inequality in public allocations. The more diverse a country, the more unequal education expenditure became.<sup>61</sup> Although the authors do not look at public health spending, a study from Asian Development Bank shows spending in the health and education sectors are to be highly correlated.<sup>62</sup> While this might explain EF, it fails to say much about the waste difference in the coefficient from low-and middle, to high-income countries. It remains unanswered at this point in this paper. The next regression will show the influence of trade openness.

Column IV examines trade openness, measured as total trade as a percentage of GDP, ethnolinguistic fractionalization, GDP per capita and women participation in parliaments. The coefficient on women in parliament remains positive, and significant for all, and high-income countries. While openness is significant for low and middle, and high-income countries, the coefficient is positive for low income and negative for high-income countries. Trade openness seems to increase government health spending for low and middle-income countries, and reduce it for high income ones. This is an interesting, contradictory result compared to what Shelton (2007) finds. Shelton found that the relationship between trade openness and government spending in high-income countries is concentrated in social security spending. That it will increase government health spending. In low-income countries trade openness is associated with spending on transportation, infrastructure, and education, unrelated to health. As mentioned previously, education and health spending are highly correlated, and this may be what's being reflected in this instance.

Column V looks at corruption, measured as a perception index where as 1 is the most, to 10, the least corrupt, in addition to the other indicators controlled for in Column IV. Although the coefficient for women participation is significant, it drops for all (0.032 to 0.024), and high-income countries (0.096 to 0.051). Interestingly, the same coefficient for

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<sup>61</sup> Addison T. and A. Rahman. (2001), "Why is so little spent on educating the poor" UNU WIDER discussion paper no. 20001/29. Helsinki: United Nation University.

<sup>62</sup> Asian Development Bank (2006), "Measuring Policy Effectiveness in Health and Education." The 37th issue of the Key Indicators of Developing Asian and Pacific Countries. Regional Surveys & Strategies. Link: [http://www.adb.org/Documents/Books/Key\\_Indicators/2006/pdf/Special-Chapter-2006.pdf](http://www.adb.org/Documents/Books/Key_Indicators/2006/pdf/Special-Chapter-2006.pdf)



low and middle-income countries is not significant, but increases from 0.05 to 0.019. This could suggest women participation in parliament in low and middle-income countries are more relevant for the relative increase in government health spending compared to high-income countries. This would be after controlling for corruption. The effect of corruption has been found to be marginal and not significant. To revisit the literature discussed in section two, corruption seems to have a negative effect for all, high, and low-and middle-income countries on government health spending. The last determinant from the literature not controlled for yet is governance. The next section aims to find a firm answer regarding women representation in parliament and its effect on government health spending as share of GDP.

Column VI examines level of democracy measured from +10, strongly democratic to -10, strongly autocratic, in addition to the indicators in Column V. This is the final cross-country regression. It presents interesting results. It shows that female participation in parliament is positive and significant for all, including low and middle-income countries. It controls for all other factors. What it suggests is that women in parliament have a relatively strong, independent impact on government health expenditure in countries with these income classifications. Why is it that the effect of female participation becomes significant only when controlling for level of democracy? One suggestion could be that parliaments in democratic countries have more power and influence compared to parliaments in autocratic countries. To have a large share of women in parliament in countries that are less democratic will have little effect. It's when parliaments have actual power that women in the respective parliament can have impact with their set of preferences. That is, to the degree women have a different set of "block" preferences. Although this paper will not examine this statement, using an interaction term between level of democracy and women participation one would be able to test this. After controlling for the level of democracy, the coefficient for women participation for high-income countries is now no longer significant. One reason for this could be non-linearity, i.e. when countries has reached a certain level with respect to income, and female representation, increasing the share of women in parliament will potentially not have a large effect. The democracy indicator is positive and significant for all, low and middle,

and high-income countries. Baqir (2003) found support for this as well; a significant impact on democracy on social spending.<sup>63</sup>

This model used cross-section country-level data to assess the relationship between women in parliament and government health spending as share of GDP for high, low, and middle-income countries, controlling for the relevant determinants found in the literature. The results indicate that women in parliament have a positive and significant effect, although not a large one. Using the coefficient from Column VI, it suggest for each percentage increase by women in parliament, government health spending as share of GDP increases by 0.033 points for all countries, and by 0.035 points for low and middle-income countries.

Are these results robust? This analysis suggests that women in parliament have a strong impact on government health expenditure. A potential could be that number of observations differs, and hence it may be wrong to compare results from one regression to the other. A simple way to fix this is to do the regressions only for the 146, 110 and 36 countries in the Column VI that have observations for all the determinants. These tables are found in Annex 3, and show by making the number of observations equally in all of the regressions the coefficient increases in strength. Another issue is that it may be omitted variables that explain female representation and changes in government health spending. As a robustness test to Model (1), the next chapter uses a fixed effect model to analyze the within country effects using data from 1997 – 2008. The purpose is to see if this model will produce similar estimates and results as the cross-country analysis.

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<sup>63</sup> Baqir, R. 2002. "Social Sector Spending in a Panel of Countries." IMF Working Paper No. WP/02/35. Washington, DC: International Monetary Fund

**Dependent Variable: Health Expenditure, Public (% of GDP), All Countries**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
Proportion of seats held by women in national parliaments (%)	0.061*** (0.017)	0.046*** (0.016)	0.042*** (0.016)	0.032** (0.015)	0.024* (0.013)	0.033*** (0.011)
GDP per capita, PPP (constant 2005 international \$)		0.064*** (0.013)	0.060*** (0.012)	0.061*** (0.012)	-0.004 (0.016)	0.015 (0.015)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-2.89*** (0.829)	-3.56*** (0.798)	-3.1*** (0.688)	-2.51*** (0.573)
Openness: Total trade as a percentage of GDP (constant prices)				0.002 (0.003)	0.002 (0.002)	-0.001 (0.002)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.553*** (0.105)	0.383*** (0.099)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.086*** (0.019)
_cons	2.931*** (0.324)	2.335*** (0.302)	2.875*** (0.337)	2.883*** (0.398)	1.396*** (0.414)	1.414*** (0.330)
Number of observations	185	172	170	168	164	146

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al. (2009)

Table 2. Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for all countries, average 2006-2008

**Dependent Variable: Health Expenditure, Public (% of GDP), Low and Middle-Income Countries**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
Proportion of seats held by women in national parliaments (%)	0.010 (0.021)	0.016 (0.020)	0.014 (0.019)	0.005 (0.017)	0.019 (0.015)	0.035*** (0.012)
GDP per capita, PPP (constant 2005 international \$)		0.057 (0.040)	0.042 (0.040)	0.032 (0.036)	-0.011 (0.037)	0.017 (0.030)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-1.81* (0.937)	-2.8*** (0.834)	-2.3*** (0.725)	-1.8*** (0.591)
Openness: Total trade as a percentage of GDP (constant prices)				0.014*** (0.004)	0.014*** (0.003)	0.008*** (0.003)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.402*** (0.143)	0.346*** (0.133)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.061*** (0.020)
_cons	3.274*** (0.371)	2.726*** (0.386)	3.110*** (0.430)	2.062*** (0.501)	0.716 (0.553)	0.606 (0.458)
Number of observations	137	131	129	128	125	110

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 3. Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for low and middle-income countries, average 2006-2008

Dependent Variable: Health Expenditure, Public (% of GDP), High Income Countries						
	I	II	III	IV	V	VI
Proportion of seats held by women in national parliaments (%)	0.112*** (0.022)	0.113*** (0.026)	0.101*** (0.020)	0.096*** (0.020)	0.051** (0.023)	0.028 (0.021)
GDP per capita, PPP (constant 2005 international \$)		-0.007 (0.027)	-0.001 (0.020)	0.012 (0.021)	-0.018 (0.021)	0.005 (0.025)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-7.24*** (1.347)	-6.17*** (1.409)	-5.9*** (1.293)	-4.31*** (1.191)
Openness: Total trade as a percentage of GDP (constant prices)				-0.006** (0.003)	-0.006** (0.003)	-0.006** (0.003)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.425*** (0.147)	0.269** (0.137)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.140*** (0.039)
_cons	3.104*** (0.502)	3.399*** (0.913)	4.330*** (0.715)	4.591*** (0.705)	3.582*** (0.772)	3.126*** (0.751)
Number of observations	48	41	41	40	39	36

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 4. Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for high-income countries, average 2006-2008

## 5.2 Within-Country Analysis – A Robustness Test

To test whether unobserved country differences – not captured by the included covariates – leads to spurious results this section estimates a *within* country model. In such a model the potential effect of gender is estimated purely on basis of the within country variation in gender representation and health spending (due to the inclusion of a fixed country effect). Data is taken from 1997 to 2008; 2007 being the earliest year available for the variable of women in parliament. 2008 is the latest year available for government health spending. By using a fixed effect model (equation 2) one can explore how the proportion of females in parliament affects government health spending when variables have to change over time within a country to be of relevance.

Table 5 describes the data used in this section, Model (2) does not control for ethnolinguistic fractionalization, trade openness, or the level of democracy. The three variables were dropped due to they change little within the selected timeframe, and therefore not applicable indicators in this analysis.

**Table 5: Summary Statistics of Variables, 1997 – 2008**

Variables	N	mean	sd	min	max
Year	2018	2002.7	3.5	1997	2008
Health expenditure, public (% of GDP), All countries	2018	3.7	2.2	0	16.7
Health expenditure, public (% of GDP), Low and middle-income	1476	3.2	2.0	0	16.7
Health expenditure, public (% of GDP), High income countries	542	5.3	1.9	0.9	10.3
Proportion of seats held by women in national parliaments (%), All countries	2018	13.5	9.6	0	56
Proportion of seats held by women in national parliaments (%), Low and middle	1476	11.9	8.5	0	56
Proportion of seats held by women in national parliaments (%), High income	542	17.9	11.1	0	47
GDP per capita, PPP (constant 2005 international \$) in thousands	1882	10.4	11.9	0.3	72.8

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 5. Summary statistics of variables in the within country dataset, 1997 – 2008

Table 6 to 8 present the results for the within country fixed effect regressions. For all tables the dependent variable is government spending on health, measured as proportion of GDP (GHEGDP). Table 6 show results for all countries, Table 7 for low and middle-income countries, and Table 8 for high-income countries. Proportion of seats held by women in national parliaments is measured in percentage (from 0 to 100), and is therefore the coefficient to be interpreted as the change in the dependent variable; government health spending as share of GDP, if the proportion of women in parliaments changes with 1 percentage point.

As can be seen from Column I in all three tables, the results of proportion of seats held by women in national parliaments as the sole independent variable. The coefficient is positive and significant for all three tables indicating that the proportion of females in parliament has a positive effect on government health spending over time.

Column II shows the models with both women in national parliaments, and the effect of including a linear time trend. The coefficient on women in national parliament remains significant, but for high-income countries the effect now becomes negative. It may be that the effect, time (year) “steals the effect” from women in parliament. Does this mean the women participation is not as relevant for government health spending in high-income countries? It may indicate that trends in women in parliament and government health expenditure is more strongly correlated for high-income countries than in low and middle-income countries given the coefficient for the latter does not drop that much, 0.038 to 0.025. This result suggests that the effect of time does have an impact on government health spending for all tables. Though, the effect might not need to be linear. Perhaps one reaches a level where more women do not have an effect, and that many high-income countries have already passed that limit.

Column III reports the models that include GDP per capita in addition to year, and women in parliament. The latter is still is significant and positive, but not for high-income countries. The effect of year is positive and significant for all models. We test for GDP per capita to find out if richer countries have higher government health spending. The

coefficient is significant for low and middle, and high-income countries, with a very small negative number. This suggests effect of GDP per capita has an effect; however it's a small effect.

The effect of a linear time trend (“year”) is positive and significant for all the models across all the tables. The time trend being positive indicates that countries use an increasing fraction of their GDP on health. As the coefficient for female representation falls when a time trend is included indicates that also female representation is increasing over time and that its effect on health spending may be overestimated when such a time trend is not included. Bringing in year (time trend) as an explanatory variable thus seems to give better and potentially more accurate regressors. The next section compares the estimates from Model (1) and (2). Are they comparable, and therefore indicate women in parliament to be a robust relevant indicator to review for countries that explore how they can increase government health spending?

<b>Dependent Variable: Health Expenditure, Public (% of GDP), All Countries</b>			
	<b>I</b>	<b>II</b>	<b>III</b>
Proportion of seats held by women in national parliaments	0.036*** (0.003)	0.018*** (0.004)	0.016*** (0.004)
Year		0.038*** (0.005)	0.043*** (0.006)
GDP per capita, PPP (constant 2005 international \$)			-0.009 (0.010)
_cons	3.262*** (0.045)	-72.7*** (9.509)	-82.8*** (11.008)
Number of observations	2,018	2,018	1,882
Note: *** p<0.01, ** p<0.05, * p<0.1			
Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.			

Table 6. Fixed Effect Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for all countries, 1997-2008



**Dependent Variable: Health Expenditure, Public (% of GDP),  
Low and Middle-Income Countries**

	<b>I</b>	<b>II</b>	<b>III</b>
Proportion of seats held by women in national parliaments	0.038*** (0.004)	0.025*** (0.005)	0.019*** (0.004)
Year		0.030*** (0.006)	0.043*** (0.007)
GDP per capita, PPP (constant 2005 international \$)			-0.08***
_cons	2.727*** (0.049)	-56.3*** (11.648)	-82.6*** (13.435)
Number of observations	1,476	1,476	1,416

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 7. Fixed Effect Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for low and middle-income countries, 1997-2008

**Dependent Variable: Health Expenditure, Public (% of GDP), High Income Countries**

	<b>I</b>	<b>II</b>	<b>III</b>
Proportion of seats held by women in national parliaments	0.028*** (0.005)	-0.012* (0.007)	-0.005 (0.008)
Year		0.070*** (0.008)	0.109*** (0.012)
GDP per capita, PPP (constant 2005 international \$)			-0.04*** (0.011)
_cons	4.783*** (0.100)	-135.*** (15.141)	-211.*** (23.111)
Number of observations	542	542	466

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

Table 8. Fixed Effect Regression estimates of general government health expenditure as share of GDP on women in parliament and other indicators for high income countries, 1997-2008

## 5.3 Comparing Cross-Country and Within Country Estimates

In Table 9 the results from the two models are compared. For each income classification, the focus is on two of the estimates. The fixed effect from row (A), and the OLS estimate from row (B). While the OLS estimate controls for all the determinants, the fixed effect does not. However, the fixed effect model takes into account the mean (country) differences in the independent variables because of the fixed effect. To include time-varying covariates in addition to female representation there is a risk they will steal some of the true effect, given they share common trends. But the flipside by not include these covariates is the risk of female representation is given too much weight.

As can be seen from all columns, comparing the OLS to the fixed effect, the estimates are corresponding, positive, and significant (with the exception of OLS in high income countries). Suggesting robust results, which suggest if countries increase the share of women in parliaments it will increase government health spending. The questions becomes: By how much?

If countries classified as low and middle-income increased their share of women in parliaments by 10 percentages points, government health spending as share of GDP would on average increase somewhere between 10 and 12 percent. For high-income countries a 10 percentage point's increase in female representation in parliament would on average increase government health spending as share of GDP by 5 percent. For all countries, the global estimate would on average imply between 8 to 10 percent increase in government health spending as share of GDP, following a 10-percentage points increase in female representation. The lower interval is the OLS coefficient (cross country estimate), and the higher interval is the fixed effect coefficient (within country estimate).<sup>64</sup>

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<sup>64</sup> Calculation: Coefficient (OLS or FE) divided by mean value of government health spending as share of GDP for the respective income classification, multiplied with the suggested increase in women participation: 10 percentage points.

Can these results be trusted? This study found a relationship, and the results are robust. There is room for discussion regarding the precision of estimates and their real effect is. Interpretation of results should always be done in a cautious manner. To begin with, this paper does not answer whether gender is a determinant of government health spending. It has shown to the relationship between gender and its effect on government health spending. To verify gender as a determinant the next step could be to try finding a causal relationship between them. An example of this would be to try determining gender as an actual consequence that effected government health spending. This could be done by studying the consequences of natural experiments in female political representation. These would arise from reforms in electoral systems or relevant legislation. This is however left to future research.

Second, there may be other aspects of female representation that could be studied, i.e. the proportion of administrative and managerial positions held by women, the proportion of local government positions held by women, and percentage of women in managerial posts. There exist data for all of these indicators. Such complementary approaches could enlighten this field even more. There are several reasons why this could give improve our understanding of the effect of gender on government health spending. Countries that does not have a high proportion of females in the parliament, but the women proportion “downwards” in the system where bills/laws, regulation, etc are written/takes place could have a impact, and could therefore indicate a interesting relationship. Female literacy rates might be another factor to review. Rahman (2008) found literacy rates to be a key determinant of public health expenditure in Indian states together with real state per capita income<sup>65</sup>, however so far there is no support in the cross country literature on this topic. Other factors of interest would be average years of schooling of female adults, and female labor force participation.

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<sup>65</sup> Rahman, T (2008), “Determinants of public health expenditure: some evidence from Indian states”, *Applied Economics Letters* 15(11);853-857.

Dependent Variable: Health Expenditure, Public (% of GDP)						
Indicators	OLS (I)	FE (III)	OLS (I)	FE (III)	OLS (I)	FE (III)
	ALL countries		Low and middle-income countries		High income countries	
	(1)		(2)		(3)	
Proportion of seats held by women in national parliaments	0.061***	0.036***	0.01	0.038***	0.112***	0.028***
(A) Standard Error (SE)	(0.017)	(0.003)	(0.021)	(0.004)	(0.022)	(0.005)
Number of observations	185	2,018	137	1,476	48	542
<b>Controlling for all determinants:</b>						
Proportion of seats held by women in national parliaments	0.033***	0.016***	0.035***	0.019***	0.028	-0.005
(B) Standard Error (SE)	(0.011)	(0.004)	(0.012)	(0.004)	(0.021)	(0.008)
Number of observations	146	1,882	110	1,416	36	466

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

OLS= Ordinary least squares; FE= Fixed effects model

Source: Collided data from tables 2, 3, 4, 6, 7, and 8

Table 9. Comparing cross country and within country estimates

## 6. CONCLUSION

This paper has examined the effect of gender on government health spending as share of GDP. It finds that if the share of women in the parliaments of low- and middle-income countries were to increase by 10 percentage points, government health spending would increase, on average, by 10 to 12 percent. For high-income countries, a similar increase in female representation is predicted to increase government health spending by 5 percent. The global estimate from the model predicts an 8 to 10 percent rise in health spending for the same increase in female representation. One possible reason the effect is stronger in low- and middle-income countries than in high-income countries is that, on average, high income countries have a higher proportion of females in parliament. Whereas the average percentage of female representatives between 1997 and 2008 in high-income countries was 17.8, the percentage in low- and middle-income countries was only 11.9 (Table 5). This could indicate that when a certain level of female representation is reached, additional female representation might have a diminishing effect.

Though broad, cross-country studies have significant value for understanding the variation in state funding for health, they cannot account for the multitude of factors beyond the immediate control of the public sector that contribute to differences in health outcomes.<sup>66</sup> Thus, a logical next step to build on this paper's global and regional perspective would be an examination of the effects of female representation on health spending and health outcomes through case studies at the country level. This approach would contribute significantly to the literature by revealing hidden determinants of health outcomes and shedding light upon *within* country variation, including regional and socio-demographic differences and gender inequalities.

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<sup>66</sup> ADB (2006), *Key Indicators: Measuring Policy Effectiveness in Health and Education*, Manila: Asian Development Bank.

## **APPENDIX 1. DETAILED INFORMATION ON COUNTRIES REGION, INCOME CLASSIFICATION, PUBLIC HEALTH SPENDING AS SHARE OF GDP, AND PROPORTION OF SEATS HEALD BY WOMEN IN NATIONAL PARLIAMENT (AVERAGE 2006 -2008)**

This table classifies all countries in the dataset using World Bank country codes and names. For operational and analytical purposes, economies are divided among income groups according to 2008 gross national income (GNI) per capita, calculated using the World Bank Atlas method. Income classifications are from the World Bank Fiscal Year 2010, and were in effect until 1 July 2010.

### **The group's income thresholds are:**

LIC (lower Income country): \$975 or less

LMC (lower middle) \$976 - \$3,855

UMC (Upper middle \$3,856 - \$11,905

HIC (High income) \$11,906 or more

### **Regions are:**

EAP: East Asia & Pacific

ECA: Europe & Central Asia

LAC: Latin America & the Caribbean

MENA: Middle East & North Africa

SAS: South Asia

SSA: Sub-Saharan Africa

**Detailed Information on Countries Region, Income Classification, Health Expenditure, Public (% of GDP), and Proportion of Seats Held by Women in National Parliaments (average 2006-2008)**

<b>World Bank Code</b>	<b>World Bank Name</b>	<b>Income Classification</b>	<b>Region</b>	<b>Public Health Expenditure (% of GDP)</b>	<b>Proportion of Seats Held by Women in National Parliaments</b>
AFG	Afghanistan	LIC	SAS	1.8	27.3
ALB	Albania	LMC	ECA	2.8	7.0
DZA	Algeria	UMC	MNA	3.6	7.3
ADO	Andorra	HIC	ECA	5.3	27.7
AGO	Angola	LMC	SSA	2.2	22.3
ATG	Antigua and Barbuda	HIC	LAC	3.4	11.0
ARG	Argentina	UMC	LAC	4.9	37.5
ARM	Armenia	LMC	ECA	1.9	7.3
AUS	Australia	HIC	EAP	6.0	25.7
AUT	Austria	HIC	ECA	7.7	32.0
AZE	Azerbaijan	LMC	ECA	0.9	11.0
BHS	Bahamas, The	HIC	LAC	3.6	14.7
BHR	Bahrain	HIC	MNA	2.5	2.0
BGD	Bangladesh	LIC	SAS	1.2	15.0
BRB	Barbados	HIC	LAC	4.5	12.0
BLR	Belarus	UMC	ECA	4.9	29.0
BEL	Belgium	HIC	ECA	7.1	35.0
BLZ	Belize	LMC	LAC	2.5	4.7
BEN	Benin	LIC	SSA	2.5	8.7
BTN	Bhutan	LMC	SAS	3.0	5.0
BOL	Bolivia	LMC	LAC	3.4	17.0
BIH	Bosnia and Herzegovina	UMC	ECA	5.6	13.0
BWA	Botswana	UMC	SSA	4.3	11.0
BRA	Brazil	UMC	LAC	3.6	9.0
BGR	Bulgaria	UMC	ECA	4.2	22.0
BFA	Burkina Faso	LIC	SSA	3.4	14.0
BDI	Burundi	LIC	SSA	5.3	31.0
KHM	Cambodia	LIC	EAP	1.6	12.0
CMR	Cameroon	LMC	SSA	1.3	12.3
CAN	Canada	HIC	NAM	7.1	21.0
CPV	Cape Verde	LMC	SSA	3.4	16.0
CAF	Central African Rep.	LIC	SSA	1.6	11.0

World Bank				Public Health Expenditure	Proportion of Seats Held by Women in National Parliaments
Code	World Bank Name	Income Classification	Region	(% of GDP)	
TCD	Chad	LIC	SSA	2.7	6.3
CHL	Chile	UMC	LAC	3.7	15.0
CHN	China	LMC	EAP	1.9	20.3
COL	Colombia	UMC	LAC	5.1	8.0
COM	Comoros	LIC	SSA	1.9	3.0
ZAR	Congo, Dem. Rep.	LIC	SSA	1.2	8.0
COG	Congo, Rep.	LMC	SSA	1.5	7.7
CRI	Costa Rica	UMC	LAC	5.8	38.3
CIV	Cote d'Ivoire	LMC	SSA	1.0	9.0
HRV	Croatia	HIC	ECA	6.4	21.0
CUB	Cuba	UMC	LAC	9.5	38.3
CYP	Cyprus	HIC	ECA	2.9	14.0
CZE	Czech Republic	HIC	ECA	5.9	16.0
DNK	Denmark	HIC	ECA	8.2	37.3
DJI	Djibouti	LMC	MNA	5.6	12.0
DMA	Dominica	UMC	LAC	3.8	15.0
DOM	Dominican Republic	UMC	LAC	2.0	20.0
ECU	Ecuador	LMC	LAC	2.3	25.0
EGY	Egypt, Arab Rep.	LMC	MNA	2.5	2.0
SLV	El Salvador	LMC	LAC	3.7	17.0
GNQ	Equatorial Guinea	HIC	SSA	1.5	14.0
ERI	Eritrea	LIC	SSA	1.5	22.0
EST	Estonia	HIC	ECA	4.0	20.7
ETH	Ethiopia	LIC	SSA	2.2	22.0
FJI	Fiji	UMC	EAP	2.7	11.0
FIN	Finland	HIC	ECA	6.2	40.7
FRA	France	HIC	ECA	8.7	16.3
GAB	Gabon	UMC	SSA	2.9	13.0
GMB	Gambia, The	LIC	SSA	2.8	10.3
GEO	Georgia	LMC	ECA	1.7	8.0
DEU	Germany	HIC	ECA	8.0	32.0
GHA	Ghana	LIC	SSA	3.6	11.0
GRC	Greece	HIC	ECA	5.9	14.7
GRD	Grenada	UMC	LAC	3.7	22.3
GTM	Guatemala	LMC	LAC	2.0	10.7



World Bank				Public Health Expenditure	Proportion of Seats Held by Women in National Parliaments
Code	World Bank Name	Income Classification	Region	(% of GDP)	
GIN	Guinea	LIC	SSA	0.7	19.0
GNB	Guinea-Bissau	LIC	SSA	1.5	14.0
GUY	Guyana	LMC	LAC	6.8	29.0
HTI	Haiti	LIC	LAC	1.3	3.3
HND	Honduras	LMC	LAC	3.8	23.0
HUN	Hungary	HIC	ECA	5.4	10.3
ISL	Iceland	HIC	ECA	8.5	32.7
IND	India	LMC	SAS	1.1	8.3
IDN	Indonesia	LMC	EAP	1.1	11.3
IRN	Iran, Islamic Rep.	LMC	MNA	3.1	3.7
IRQ	Iraq	LMC	MNA	2.2	26.0
IRL	Ireland	HIC	ECA	6.3	13.0
ISR	Israel	HIC	ECA	4.5	14.0
ITA	Italy	HIC	ECA	6.8	18.3
JAM	Jamaica	UMC	LAC	2.3	12.7
JPN	Japan	HIC	EAP	6.5	9.0
JOR	Jordan	LMC	MNA	5.1	6.0
KAZ	Kazakhstan	UMC	ECA	2.4	14.0
KEN	Kenya	LIC	SSA	1.8	7.7
KIR	Kiribati	LMC	EAP	13.7	5.0
KOR	Korea, Rep.	HIC	EAP	3.5	13.3
KWT	Kuwait	HIC	MNA	1.6	2.3
KGZ	Kyrgyz Republic	LIC	ECA	3.3	8.7
LAO	Lao PDR	LIC	EAP	0.7	25.0
LVA	Latvia	UMC	ECA	3.9	19.3
LBN	Lebanon	UMC	MNA	4.1	5.0
LSO	Lesotho	LMC	SSA	3.7	20.3
LBR	Liberia	LIC	SSA	2.9	13.0
LBY	Libya	UMC	MNA	1.9	8.0
LTU	Lithuania	UMC	ECA	4.5	23.3
LUX	Luxembourg	HIC	ECA	6.5	23.0
MKD	Macedonia, FYR	UMC	ECA	5.0	29.3
MDG	Madagascar	LIC	SSA	2.8	7.7
MWI	Malawi	LIC	SSA	6.9	13.7
MYS	Malaysia	UMC	EAP	1.9	9.7

World Bank		Income		Public Health Expenditure		Proportion of Seats Held by Women in National Parliaments
Code	World Bank Name	Classification	Region	(% of GDP)		
MDV	Maldives	LMC	SAS	7.0		12.0
MLI	Mali	LIC	SSA	2.8		10.0
MLT	Malta	HIC	ECA	6.0		9.0
MHL	Marshall Islands	LMC	EAP	13.8		3.0
MRT	Mauritania	LIC	SSA	1.6		20.0
MUS	Mauritius	UMC	SSA	2.0		17.0
MEX	Mexico	UMC	LAC	2.7		23.0
FSM	Micronesia, Fed. Sts.	LMC	EAP	12.7		0.0
MDA	Moldova	LMC	ECA	5.0		22.0
MCO	Monaco	HIC	ECA	3.1		22.3
MNG	Mongolia	LMC	EAP	3.2		4.7
MNE	Montenegro	UMC	ECA	5.5		9.7
MAR	Morocco	LMC	MNA	1.8		11.0
MOZ	Mozambique	LIC	SSA	3.8		35.0
NAM	Namibia	UMC	SSA	3.3		27.0
NPL	Nepal	LIC	SAS	1.8		18.7
NLD	Netherlands	HIC	ECA	7.4		37.7
NZL	New Zealand	HIC	EAP	7.1		32.3
NIC	Nicaragua	LMC	LAC	4.5		19.7
NER	Niger	LIC	SSA	3.0		12.0
NGA	Nigeria	LMC	SSA	1.7		6.7
NOR	Norway	HIC	ECA	7.3		37.3
OMN	Oman	HIC	MNA	1.9		0.7
PAK	Pakistan	LMC	SAS	0.8		21.7
PLW	Palau	UMC	EAP	8.5		0.0
PAN	Panama	UMC	LAC	4.7		17.0
PNG	Papua New Guinea	LMC	EAP	2.6		1.0
PRY	Paraguay	LMC	LAC	2.6		11.0
PER	Peru	UMC	LAC	2.6		29.0
PHL	Philippines	LMC	EAP	1.3		19.7
POL	Poland	UMC	ECA	4.5		20.0
PRT	Portugal	HIC	ECA	7.1		23.3
QAT	Qatar	HIC	MNA	2.8		0.0
ROM	Romania	UMC	ECA	3.7		10.3
RUS	Russian Federation	UMC	ECA	3.4		11.3

					Proportion of Seats Held by Women in National Parliaments
World Bank		Income		Public Health Expenditure (% of GDP)	
Code	World Bank Name	Classification	Region		
RWA	Rwanda	LIC	SSA	4.8	51.3
WSM	Samoa	LMC	EAP	4.2	7.3
SMR	San Marino	HIC	ECA	6.1	12.0
STP	Sao Tome and Principe	LMC	SSA	5.3	3.7
SAU	Saudi Arabia	HIC	MNA	2.7	0.0
SEN	Senegal	LIC	SSA	3.2	21.0
SRB	Serbia	UMC	ECA	6.0	18.0
SYC	Seychelles	UMC	SSA	3.4	25.7
SLE	Sierra Leone	LIC	SSA	1.3	13.7
SGP	Singapore	HIC	EAP	1.1	23.7
SVK	Slovak Republic	HIC	ECA	5.1	19.3
SVN	Slovenia	HIC	ECA	5.7	12.3
SLB	Solomon Islands	LMC	EAP	4.5	0.0
ZAF	South Africa	UMC	SSA	3.5	33.0
ESP	Spain	HIC	ECA	6.1	36.0
LKA	Sri Lanka	LMC	SAS	1.9	5.3
KNA	St. Kitts and Nevis	UMC	LAC	3.5	4.7
LCA	St. Lucia	UMC	LAC	3.7	7.7
VCT	St. Vincent & Grenadines	UMC	LAC	3.4	18.0
SDN	Sudan	LMC	SSA	1.4	17.0
SUR	Suriname	UMC	LAC	3.7	26.0
SWZ	Swaziland	LMC	SSA	4.0	11.0
SWE	Sweden	HIC	ECA	7.4	47.0
CHE	Switzerland	HIC	ECA	6.3	28.0
SYR	Syrian Arab Republic	LMC	MNA	1.7	12.0
TJK	Tajikistan	LIC	ECA	1.2	18.0
TZA	Tanzania	LIC	SSA	3.6	30.0
THA	Thailand	LMC	EAP	2.7	10.5
TMP	Timor-Leste	LMC	EAP	11.3	27.3
TGO	Togo	LIC	SSA	1.6	9.0
TON	Tonga	LMC	EAP	3.2	3.0
TTO	Trinidad and Tobago	HIC	LAC	2.6	21.7
TUN	Tunisia	LMC	MNA	3.0	23.0
TUR	Turkey	UMC	ECA	3.5	7.3
TKM	Turkmenistan	LMC	ECA	1.3	16.0

World Bank		Income Classification	Region	Public Health Expenditure		Proportion of Seats Held by Women in National Parliaments
Code	World Bank Name			(% of GDP)		
UGA	Uganda	LIC	SSA	1.6		30.3
UKR	Ukraine	LMC	ECA	3.9		8.5
ARE	United Arab Emirates	HIC	MNA	1.8		15.3
GBR	United Kingdom	HIC	ECA	7.1		20.0
USA	United States	HIC	NAM	7.2		16.0
URY	Uruguay	UMC	LAC	6.4		11.3
UZB	Uzbekistan	LIC	ECA	2.4		18.0
VUT	Vanuatu	LMC	EAP	2.8		4.0
VEN	Venezuela, RB	UMC	LAC	2.5		18.7
VNM	Vietnam	LIC	EAP	2.6		26.3
YEM	Yemen, Rep.	LIC	MNA	1.6		0.0
ZMB	Zambia	LIC	SSA	3.7		15.0
ZWE	Zimbabwe	LIC	SSA	4.3		16.0
Total: 185						

## APPENDIX 2: TABLES: ADDITIONAL REGRESSION ESTIMATES

REGRESSION ESTIMATES OF GENERAL GOVERNMENT HEALTH EXPENDITURE AS  
SHARE OF GDP ON WOMEN IN PARLIAMENT AND OTHER INDICATORS FOR ALL, LOW AND MIDDLE,  
AND HIGH INCOME COUNTRIES, AVERAGE 2006-2008.

**Dependent Variable: Health Expenditure, Public (% of GDP), All Countries**

	I	II	III	IV	V	VI
Proportion of seats held by women in national parliaments (%)	0.088*** (0.015)	0.061*** (0.013)	0.054*** (0.012)	0.054*** (0.012)	0.035*** (0.012)	0.033*** (0.011)
GDP per capita, PPP (constant 2005 international \$)		0.075*** (0.010)	0.073*** (0.010)	0.075*** (0.010)	0.003 (0.016)	0.015 (0.015)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-3.078*** (0.659)	-2.972*** (0.674)	-2.655*** (0.611)	-2.514*** (0.573)
Openness: Total trade as a percentage of GDP (constant prices)				-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.002)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.560*** (0.098)	0.383*** (0.099)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.086*** (0.019)
_cons	2.042*** (0.284)	1.649*** (0.250)	2.289*** (0.271)	2.431*** (0.329)	1.343*** (0.352)	1.414*** (0.330)
Number of observations	146	146	146	146	146	146

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al. (2009)

**Dependent Variable: Health Expenditure, Public (% of GDP), Low and Middle-Income Countries**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
Proportion of seats held by women in national parliaments (%)	0.043***	0.040***	0.035***	0.036***	0.035***	0.035***
	(0.014)	(0.014)	(0.013)	(0.013)	(0.012)	(0.012)
GDP per capita, PPP (constant 2005 international \$)		0.093***	0.090***	0.080***	0.020	0.017
		(0.028)	(0.028)	(0.027)	(0.031)	(0.030)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-1.855***	-1.992***	-1.800***	-1.765***
			(0.660)	(0.645)	(0.615)	(0.591)
Openness: Total trade as a percentage of GDP (constant prices)				0.008**	0.007**	0.008***
				(0.003)	(0.003)	(0.003)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.469***	0.346***
					(0.132)	(0.133)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.061***
						(0.020)
_cons	2.221***	1.807***	2.219***	1.585***	0.507	0.606
	(0.253)	(0.273)	(0.302)	(0.386)	(0.475)	(0.458)
Number of observations	110	110	110	110	110	110

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

**Dependent Variable: Health Expenditure, Public (% of GDP), High Income Countries**

	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>
Proportion of seats held by women in national parliaments (%)	0.106*** (0.027)	0.111*** (0.028)	0.097*** (0.022)	0.098*** (0.020)	0.054** (0.024)	0.028 (0.021)
GDP per capita, PPP (constant 2005 international \$)		-0.024 (0.035)	-0.007 (0.027)	-0.002 (0.026)	-0.037 (0.026)	0.005 (0.025)
Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups			-7.063*** (1.434)	-5.509*** (1.533)	-4.969*** (1.384)	-4.310*** (1.191)
Openness: Total trade as a percentage of GDP (constant prices)				-0.008** (0.004)	-0.008** (0.003)	-0.006** (0.003)
Corruption Perceptions Index: (1, most to 10, least corrupt)					0.445*** (0.151)	0.269** (0.137)
Level of democracy: +10, strongly democratic to -10, strongly autocratic						0.140*** (0.039)
_cons	3.216*** (0.641)	3.834*** (1.125)	4.544*** (0.873)	4.997*** (0.852)	4.004*** (0.834)	3.126*** (0.751)
Number of observations	36	36	36	36	36	36

Note: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: World Health Organization, World Bank, United Nations, Transparency International, Penn World Table, The Center for Systemic Peace, Desmet et al.

## APPENDIX 3. DO-FILE FOR STATA ESTIMATIONS

Do files for merging, tables and graphs are left out.

```
cd "/Users/geirlie/Desktop/Gender/data"
```

```
use gender.dta, replace
```

```
*Genereate variables to mean
```

```
*egen temp=mean(elf), by(wbcode)
```

```
*replace temp=. if year!=2008
```

```
*command to move the ELF data from 2009 to 2008 in the dataset so we can use the same  
commands as the other var in the do file
```

```
*ELF 2009 data are for many different years, but collected in one year
```

```
*drop elf
```

```
*ren temp elf
```

```
*Get GDP PC PPP to be in thousands units instead of "raw units" e.g. before: Norway 2008  
49711.35 after 49.711. This makes it easier to interpret the coeficcient in the regression  
replace gdppcpcpp=gdppcpcpp/1000
```

```
foreach var of varlist polity2-ghgedp {  
    egen a`var'=mean(`var') if year>=2006 & year<=2008, by(wbcode)  
}
```

```
****LABEL AVG INDICATORS to use var names in reg output
```

```
label variable aghedgp "Health expenditure, public (% of GDP)"
```

```
label variable aparliament "Proportion of seats held by women in national parliaments (%)"
```

```
label variable agdppcpcpp "GDP per capita, PPP (constant 2005 international $)"
```

```
label variable acpi "Corruption Perceptions Index: (1, most to 10, least corrupt)"
```

```
label variable apolity2 "Level of democracy: +10, strongly democratic to -10, strongly  
autocratic"
```

```
label variable aopenk "Openness: Total trade as a percentage of GDP, (constant prices)"
```



label variable aelf "Ethnolinguistic fractionalization:Probability two randomly picked individuals belong to different groups"

\*label variable aelf "ELF(1) Fractionalization measured at different levels of linguistic aggregation"

label variable elf "Ethnolinguistic fractionalization: Probability two randomly picked individuals belong to different groups"

label variable agini "Gini index"

label variable acpia "CPIA gender equality rating (1=low to 6=high)"

label variable agem "Gender Empowerment Measure (Value)"

egen country=group(wbcode)

xtset country year

\*ALL COUNTRIES\_\_\_\_\_Regressions, cross country comparsion

\*Controlling for determinants of government health spending  
estimates clear

reg aghegdp aparliament if year==2008

estimates store I

reg aghegdp aparliament agdppcPPP if year==2008

estimates store II

reg aghegdp aparliament agdppcPPP aelf if year==2008

estimates store III

reg aghegdp aparliament agdppcPPP aelf aopenk if year==2008

estimates store IV

reg aghegdp aparliament agdppcPPP aelf aopenk acpi if year==2008

estimates store V

reg aghegdp aparliament agdppcPPP aelf aopenk acpi apolity2 if year==2008

estimates store VI

erase tableall.xml

xml\_tab I II III IV V VI, append stats (r2 r2\_a N) sd below font("Book Antiqua" 8) ///

```

title("Dependent Variable: Health Expenditure, Public (% of GDP), All Countries") sheet(table I,
nogridlines) save(/Users/geirlie/Desktop/Gender/data/tableall) ///
notes("Source: World Health Organization, World Bank, United Nations, Transparency
International, Penn World Table, The Center for Systemic Peace, Desmet et al.")

```

```

*LOW AND MIDDLE INCOME COUNTRIES_____Regressions, cross country comparsion
estimates clear

```

```

reg aghegdp aparliament if year==2008 & classification!="HIC"

```

```

estimates store I

```

```

reg aghegdp aparliament agdppcpcpp if year==2008 & classification!="HIC"

```

```

estimates store II

```

```

reg aghegdp aparliament agdppcpcpp aelf if year==2008 & classification!="HIC"

```

```

estimates store III

```

```

reg aghegdp aparliament agdppcpcpp aelf aopenk if year==2008 & classification!="HIC"

```

```

estimates store IV

```

```

reg aghegdp aparliament agdppcpcpp aelf aopenk acpi if year==2008 & classification!="HIC"

```

```

estimates store V

```

```

reg aghegdp aparliament agdppcpcpp aelf aopenk acpi apolity2 if year==2008 &

```

```

classification!="HIC"

```

```

estimates store VI

```

```

*erase tableall.xml

```

```

xml_tab I II III IV V VI, append stats (r2 r2_a N) sd below font("Book Antiqua" 8) ///

```

```

title("Dependent Variable: Health Expenditure, Public (% of GDP), Low and Middle-Income
Countries") sheet(table I, nogridlines) save(/Users/geirlie/Desktop/Gender/data/tablelic) ///

```

```

notes("Source: World Health Organization, World Bank, United Nations, Transparency
International, Penn World Table, The Center for Systemic Peace, Desmet et al.")

```

\*HIGH INCOME COUNTRIES\_\_\_\_\_Regressions, cross country comparsion  
estimates clear

reg aghegdp aparliament if year==2008 & classification=="HIC"

estimates store I

reg aghegdp aparliament agdppcPPP if year==2008 & classification=="HIC"

estimates store II

reg aghegdp aparliament agdppcPPP aelf if year==2008 & classification=="HIC"

estimates store III

reg aghegdp aparliament agdppcPPP aelf aopenk if year==2008 & classification=="HIC"

estimates store IV

reg aghegdp aparliament agdppcPPP aelf aopenk acpi if year==2008 & classification=="HIC"

estimates store V

reg aghegdp aparliament agdppcPPP aelf aopenk acpi apolity2 if year==2008 &

classification=="HIC"

estimates store VI

xml\_tab I II III IV V VI, append stats (r2 r2\_a N) sd below font("Book Antiqua" 8) ///

title("Dependent Variable: Health Expenditure, Public (% of GDP), High Income Countries")

sheet(table I, nogridlines) save(/Users/geirlie/Desktop/Gender/data/tablehic) ///

notes("Source: World Health Organization, World Bank, United Nations, Transparency  
International, Penn World Table, The Center for Systemic Peace, Desmet et al.")

\*

\*Regressions, WITHIN COUNTRIES EFFECT,

cd "/Users/geirlie/Desktop/Gender/data"

use gender.dta, replace

label variable ghegdp "Health expenditure, public (% of GDP)"

label variable parliament "Proportion of seats held by women in national parliaments (%)"

label variable gdppcPPP "GDP per capita, PPP (constant 2005 international \$)"

label variable cpi "Corruption Perceptions Index: (1, most to 10, least corrupt)"

```
label variable polity2 "Level of democracy: +10, strongly democratic to -10, strongly autocratic"
```

```
label variable openk "Openness: Total trade as a percentage of GDP, (constant prices)"
```

```
egen country=group(wbcode)
```

```
xtset country year
```

```
estimates clear
```

```
replace gdppcPPP=gdppcPPP/1000
```

```
*ALL COUNTRIES
```

```
xtreg ghegdp parliament, fe
```

```
estimates store I
```

```
xtreg ghegdp parliament year, fe
```

```
estimates store II
```

```
xtreg ghegdp parliament year gdppcPPP, fe
```

```
estimates store III
```

```
xtreg ghegdp parliament year gdppcPPP cpi, fe
```

```
estimates store IV
```

```
xtreg ghegdp parliament year gdppcPPP cpi polity2, fe
```

```
estimates store V
```

```
xtreg ghegdp parliament year gdppcPPP cpi polity2 openk, fe
```

```
estimates store VI
```

```
xml_tab I II III IV V VI, append stats (r2 r2_a N) sd below font("Book Antiqua" 8) ///
```

```
title("Dependent variable: Health expenditure, public (% of GDP), All countries") sheet(table I,  
nogridlines) save(/Users/geirlie/Desktop/Gender/data/tableall-fe) ///
```

```
notes("Source: World Health Organization, World Bank, United Nations, Transparency  
International, Penn World Table, The Center for Systemic Peace, Desmet et al. (2009)")
```

```
estimates clear
```

```
**LOW AND MIDDLE INCOME COUNTRIES
```

```

xtreg ghegdp parliament if classification!="HIC", fe
estimates store I
xtreg ghegdp parliament year if classification!="HIC", fe
estimates store II
xtreg ghegdp parliament year gdppcPPP if classification!="HIC", fe
estimates store III
xtreg ghegdp parliament year gdppcPPP cpi if classification!="HIC", fe
estimates store IV
xtreg ghegdp parliament year gdppcPPP cpi polity2 if classification!="HIC", fe
estimates store V
xtreg ghegdp parliament year gdppcPPP cpi polity2 openk if classification!="HIC", fe
estimates store VI

xml_tab I II III IV V VI, append stats (r2 r2_a N) sd below font("Book Antiqua" 8) ///
title("Dependent variable: Health expenditure, public (% of GDP), Low and middle income
countries") sheet(table I, nogridlines) save(/Users/geirlie/Desktop/Gender/data/tableIc-fe)
///
notes("Source: World Health Organization, World Bank, United Nations, Transparency
International, Penn World Table, The Center for Systemic Peace, Desmet et al. (2009)")
estimates clear

*HIGH INCOME COUNTRIES
xtreg ghegdp parliament if classification=="HIC", fe
estimates store I
xtreg ghegdp parliament year if classification=="HIC", fe
estimates store II
xtreg ghegdp parliament year gdppcPPP if classification=="HIC", fe
estimates store III
xtreg ghegdp parliament year gdppcPPP cpi if classification=="HIC", fe
estimates store IV
xtreg ghegdp parliament year gdppcPPP cpi polity2 if classification=="HIC", fe
estimates store V

```

```
xtreg ghegdp parliament year gdppcpcpi polity2 openk if classification=="HIC", fe  
estimates store VI
```

```
xml_tab I II III IV V VI, append stats (r2 r2_a N) sd below font("Book Antiqua" 8) ///  
title("Dependent variable: Health expenditure, public (% of GDP), high income countries")  
sheet(table I, nogridlines) save(/Users/geirlie/Desktop/Gender/data/tablehic-fe) ///  
notes("Source: World Health Organization, World Bank, United Nations, Transparency  
International, Penn World Table, The Center for Systemic Peace, Desmet et al. (2009)")
```